***Comments from Mike Alesandrini***
***St. Louis RCGA***
***Received by email: March 29, 2005***

John and Linda,

It is my understanding that you received comments from Kevin Perry on behalf of both REGFORM and RCGA. As he noted, we couched those comments largely in response to the issues raised in Bob Geller's February 18th memo. I have a couple other comments that I'd like to pass on of a more general nature which reflect some observations of my members that you might find helpful in crafting the final draft of the guidance. If I can provide any additional information/clarification regarding these observations, please do not hesitate to contact me.

Thanks,

Mike Alesandrini
St. Louis RCGA

> Given that tanks, CERCLA and RCRA sites all have their own set of hoops to jump through that are fairly well defined, it seems that the most significant impact of this guidance may be felt in the VCP arena. As those sites, by definition, are (generally) less contaminated, market driven and often managed by folks with less capital and environmental sophistication, a highly complicated RBCA process might be inconsistent with the incentive-based flavor of a voluntary clean-up program. While I don't have specific suggestions as to how/where to simplify the guidance, it seems appropriate to shoot for "simplicity and user friendly" as the adjectives that might describe the final document.
>
> At some point, further discussion may be appropriate to address situations in which measured contamination levels on a site, particularly in an urban setting, reflect the background for that particular urban setting which are not site-specific and are not the responsibility of the current or past owners/operators of the site. In other words, how do we address situations in which RBCA might require a clean-up of a site well beyond the background levels of all the other properties in the immediate vicinity which have accrued a collective level of contamination associated with years of a ubiquitous urban environment?

***Comments from Sherry Boldt***
***BP America Inc.***
***Received by letter***

March 28, 2005

Ms. Linda Vogt
Hazardous Waste Program
Missouri Department of natural Resources
PO Box 176
Jefferson City, MO 65102

**RE: Comments on Draft MO Risk-Based Corrective Action (MRBCA) Technical Guidance Document**

Dear Ms. Vogt:

Thank you for the opportunity to provide comments on MO's MRBCA Guidance Document. BP wholeheartedly appreciates our participation in the stakeholder group to implement the above-referenced initiative and looks forward to our continued working relationship.

The comments are divided into two basic categories: general comments that address issues or concerns identified in the document as a whole and specific comments that address issues or concerns identified in the language or implementation processes of specific sections of the document.

**General Comments**

1. This document has been in preparation by the department and the stakeholder group for several years now. The department has done a commendable job finalizing the document on behalf of the agency and the stakeholders over the last year or so. However, due to the size of the document and the technical nature of the initiative, the requested review timeframe of six weeks is not enough time to thoroughly review the document and provide meaningful comments regarding its implementation. BP recognizes that additional review time will be afforded following the document's publishing in the state register as draft guidance/regulation. BP feels that additional time should be afforded the agency and the stakeholder group to meet and discuss implementation issues on which we are not currently in agreement.

2. Throughout the stakeholder process, the MDNR reserved the right to amend/update the document should new science become available that necessitated the same. BP also believes that the stakeholder group should be afforded the same rights and believes that a clearly articulated statement to this effect would be beneficial for all parties working with the document on a going forward basis.

3. In numerous areas throughout the document and its attachments, various values and process sections are missing. Most notably missing are page 9 of 9 in all of

the tables in Appendix B and the gasoline-related chemicals of concern. BP feels that the document should be completed in its entirety, for ease of review, and the stakeholders afforded ample opportunity to review the document in a completed form. Review of the document in a partially completed form causes uncertainty and confusion that could prevent the most successful implementation possible.

4. In numerous areas throughout the document and its attachments, various references to the Geologist Registration Act appear. However, all of the references are not consistent. Some references detail that a PG must conduct the field work herself/himself; while others details that the work may be performed under the supervision of a RG or PE. BP believes that if all of the work is conducted under the supervision of a RG/PE, the intent of the Geologist Registration Act has been met. BP requests that all references to the Geologist Registration Act be amended accordingly.

5. Throughout the stakeholder discussions, the stakeholders held firm to the belief that the determination of a likely future use scenario would be based upon the phrase "reasonably anticipated future use". This wording has specific meaning in federal regulation, and the stakeholders desired to have this same meaning emplaced in this state guidance document. Management of future land use through a variety of Activity and Use Limitations can still be recognized and accomplished in the document and in perpetuity with the previously agreed to term. Modification of the previously agreed to term to future use could create an obligation on the part of the remediating entity to consider every potential future use even if that use is not reasonably anticipated. Application of AULs and LTS requirements to sites that meet a non-residential standard and whose reasonably anticipated future use is non residential is overly burdensome. BP requests that the previously agreed to term be returned throughout the document.

6. The inclusion of a Default Target Level in the process creates unnecessary complication and complexity without adding a proportionate amount or degree of value. Inclusion of a DTL level makes the process appear to be a four tier process and creates obligations at the Tier I level, among other things to develop an exposure model. Tier I should be a simple comparison of site contaminant concentrations to conservative risk based screening levels on an exposure pathway specific basis. The RBSLs should be established to be protective of human health and the environment any where in the state. If site contaminant concentrations are below the Tier 1 RBSLs, the site should be granted a "No Further Action" classification without additional effort. BP requests that the MDNR give consideration to eliminating the DTL applied throughout the regulation.

7. Review of the Tanks Section RBCA guidance document and the MRBCA overarching guidance document revealed a number of inconsistencies. A few of these inconsistencies are the definition of the site and delineation criteria associated with petroleum related contaminants of concern. Regardless of in which regulatory program a responsible party is working, the definitions of an impacted site should be the same (i.e. the site should be based on either real estate property boundaries or area of impact) and the degree to which that impact needs to be assessed should be the same (i.e. impact delineation criteria should be based

upon the specific soil type encountered and the specific land use of which the impact exists). BP requests that MDNR eliminate these inconsistencies between documents.

8. In numerous areas throughout the document, the MDNR makes reference to comparisons to both the DTLs and the water Quality Standards (WQS). Water Quality Standards should only apply and be considered when the groundwater to surface water exposure pathway is actually complete or potentially complete. Please remove the references to the WQS in all areas of the document unless the surface water pathway is a complete pathway and consequently a direction consideration.

9. BP requests that the MDNR agree to a meeting with stakeholders, between the March 28, 2005 preliminary comment deadline and the April 29, 2005 comment response deadline, to mutually create the punch list of remaining issues to address and to build consensus as to how the comments will be reviewed and addressed to the satisfaction of both the agency and the stakeholder group. The process used throughout this guidance development since the Hazardous Waste Management Commission directive has largely been a consensus building process. BP feels that this consensus building process used heretofore should be maintained throughout the final guidance document and regulation implementation.

**Specific Comments**

**2.1 Long Term Stewardship Requirements**

"…and any LTS activities needed to guarantee that, for as long as residual contamination on site remains above unrestricted use levels, there will be knowledge of and adherence to the assumptions included in the risk calculations."

If a site has been remediated to non residential standards, through either active remedial action or natural attenuation and residential usage in not a reasonably anticipated future use, the site should not be required to implement any AULs or be subject to any LTS monitoring activities. Notice of the contaminant concentrations and the location of the impact recorded to the deed in the public sector, will enable an understanding by any subsequent developer, wishing to develop the site for a previously unanticipated future use, of the site conditions to a great enough degree that appropriate action will be undertaken. Creating a requirement to implement AULs and LTS monitoring obligations on a project site whose contaminant concentrations are above residential standards when the reasonably anticipated future use does not include residential usage is overly burdensome and will impede brown field redevelopment.

**2.2.3 Letters of Completion**

"If the maximum soil and groundwater concentrations do not exceed the DTLs and if the site poses no ecological risk, the remediating party may petition the department for a Letter of Completion."

Assuming that the initial site characterization report provides a NFA recommendation and the site characteristics support such a recommendation, the remediating party should

not have to petition the department for a letter of completion. The department should issue the letter of completion upon concurrence with the consultant's or remediating party's recommendation.

**4.3.2 Actions to Prevent Further Deterioration**

"As soon as possible, remove any light, non-aqueous phase product floating on groundwater or surface water or that has collected in excavations, and"

To be consistent with federal regulations, the phrase "and to the maximum extent practicable" should be added to the original phrase after "As soon as possible". Free product removal beyond with is practicable is a waste of resources and effort.

**5.1 MRBCA Objective of the Initial Site Characterization**

"Which of the above four alternatives is selected will depend on a variety of site-specific and economic factors."

All of the bulleted items in the previous paragraph to which this sentence refers are not alternatives. The previous paragraph and section title describe them as objectives. Only one decision to which any alternatives apply can be gleaned from the bulleted items and is likely the following. Does the remediation party cleanup to DTLs/WQSs or proceed to a tiered risk assessment? It appears to BP that the first two may be objectives of the initial site characterization and the last two involve the remediating party's decision to the above-referenced question. BP suggests the paragraph's wording be modified.

**5.3 Collection of Data**

"The work plan must meet the minimum Data Quality Assurance/Quality Control requirements of the department's Quality Management Plan (See Appendix K for more details.)"

After review of Appendix K, it became clear that the minimum requirements in the department's QMP are very similar to the RCRA/CERCLA quality assurance project plan (QAPP) or data quality objective (DQO) process. This level of detail is more than most sites participating in the program outside of the RCRA and CERCLA programs need or should be required to perform. BP suggests minimizing the use of the QAPP/DQO process on sites where it is not needed.

"This happens because the concentration of chemicals that can be positively detected in the environmental media (soil, groundwater, sediments, and air) are limited by the capabilities of the analytical method used. "

This statement is not completely accurate. Increased method detection limits normally occur within analytical laboratory reports due to a detection of an analyte of interest out of the initial or continuing calibration range of the instrument (GC or GC/MS) being used. This detail can easily be corrected with the laboratory. If the laboratory is required to report the most method compliant analytical results regardless of the number of extractions or dilutions it takes to achieve that end point, the issue is addressed satisfactorily. (e.g. a non detect MW – 1 benzene result can be reported without dilution

from the first run since it was within calibration range of 0 – 2000 ppm and a 8,000 ppm MW – 1 xylene hit can be reported with a five fold dilution within the new 0 – 10,000 ppm calibration range.) BP suggests the department consider revisions to address this issue.

"For information purposes, the following have been identified in Appendix B:

- COCs with DTLs or Tier 1 RBTLs lower than the detection limit or Practical Quantitation Limit (PQL) of the current analytical methods and
- COCs that do not have a standard method listed in SW-846"

The chemicals of concern to which these statements apply should be identified for the stakeholder group so that the stakeholder group and the MDNR may come to resolution within the consensus building approach. BP requests that the chemicals of concern to which these statements apply be identified.

**6.12.1 Logging of Soil and Groundwater Monitoring Well Boreholes**

"A qualified professional - a Registered Geologist (R.G.) or Professional Engineer (P.E.) registered in Missouri - must log each soil boring to indicate depths correlating with changes in lithology (with lithologic descriptions), occurrence of groundwater, total depth, visual and olfactory observations, and other pertinent data such as a soil vapor screening reading."

Does this mean that a RG or PE must be at the drill rig, or can a junior geologist/engineer log the hole and provides notes to the overseeing RG and PE for them to finalize the log? It may be impractical to have an RG or PE log every hole at a site.

**8.7 Step 6: If Necessary, Calculate Cumulative Site-wide Risk and Compare With Acceptable Risk**

"Non-carcinogenic Risk

- The hazard index for each chemical, which is the sum of hazard quotients for all complete exposure pathways for each chemical (the total risk), must not exceed 1.0.
- The site-wide hazard index, which is the sum of hazard quotients for all chemicals and all complete exposure pathways, must not exceed 1.0"

Non-carcinogenic risk is not afforded an order of magnitude relief between total risk and cumulative risk as is carcinogenic risk. BP requests that the MDNR give some consideration to relief of non-carcinogenic target risk through the site-wide hazard index.

**11.3.2Ordinances and Supporting Memoranda of Agreement**

"5. A commitment by the unit of local government to maintain a list of all sites within the geographical unit of local government that have received Letters of Completion under the MRBCA process."

Previously in this section, the MDNR has referenced the potential use of a UECA. If that is the case, the agency would assumedly be maintaining the UECA database. Establishing a requirement to have the local unit of government also maintain a database is duplicative and will diminish the degree to which a community or legal entity will actively participate in the process. If the nature and extent of contamination and the activity and use limitations are documented with the real estate records by the county recorded of deeds and notification is made to potentially affected adjacent property owners and utility companies, all parties who have the potential to affect the property's usage have been duly informed. The likelihood that an AUL would be violated is minimal. BP requests that MDNR reconsider its requirements on AUL duplicity, consider the LTS options currently available within the private sector, and acknowledge its own responsibilities in regards to LTS.

"Sites on the latter list may be candidates for listing on the existing State Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites"

Any intention to have sites wherein AULs are invoked listed on the above-referenced database will minimize the value which the guidance document bring to the state, minimize real estate development of brownfields, and cause contaminated properties to remain vacant. BP requests that MDNR reconsider its position in this regard.

**Appendix B, Table B-1, Lowest Default Target Levels**

Page B-4: "* Values associated with chemicals that are common to both the departmental and tanks MRBCA (such as benzene) are being posted separately. However, when final, this information will be included in this guidance."

Many chemical's default target levels (DTLs) are not included in the MRBCA guidance, include benzene, ethylbenzene, toluene, xylenes, methyl tertiary butyl ether (MTBE), benzo(a)pyrene and similar polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and lead. Based on the caveat printed on page B-4, their DTLs will not be posted until the guidance is final, which does not allow any review and comment on the levels and their source. With the importance of those chemicals on final remedy selection and cleanup goals at many sites, it is important to have a review of all DTLs before they are promulgated as final.

**Appendix B, Tables B-2 through B-16**

Same comment as above. No screening levels are presented for chemicals listed above.

**Appendix B, Tables B-2 through B-14 and B-16**

There is no back-up or definition of what constitutes Sandy (Soil Type 1) versus Silty (Soil Type 2) versus Clayey (Soil Type 3) soil types. Overall, please provide references on defining soil types and in the calculation of the DTLs, Tier 1 screening levels, and saturation soil concentrations. The notes state that Soil type 1 (sandy) includes sand, loamy sand, and sandy loam, Soil type 2 (silty) includes clay loam, silt, loam, silty clay loam, sandy clay loam, and silt loam, Soil type 3 (clayey) includes clay, silty clay, and sandy clay. Does that mean as defined under the United States Department of Agriculture (USDA) Triangular Classification system? There are several classification

systems commonly used for characterization, including American Association of State Highway and Transportation Officials (AASHTO) and Unified Soil Classification System which each have slightly different definitions of sand, silt and clay soils.

Furthermore, many of the DTLs and screening levels for each of the three soils types are either the same (e.g., manganese and vanadium on Table B-14) or very similar (e.g., chlorobenzene and styrene on Table B-14). In addition, some chemicals have higher screening level concentrations with sandy soils versus silt and clay, while others the opposite is true. For example, on Table B-14 - Tier 1 Soil Concentrations Protective of Domestic Use of Groundwater Pathway, chemicals n-Hexane and Isopropylbenzene show a decreasing trend in concentrations with soil type, while 4-Isopropyltoluene and Methyl Ethyl Ketone show an increasing trend with soil type. All are similar volatile hydrocarbons and noncarcinogenic compounds, so they should show similar trends of screening levels with changes in soil type. Please provide backup or examples of the calculations.

**Appendix C, Section C.2 CALCULATION OF REPRESENTATIVE CONCENTRATIONS - C.2.1 Surficial Soil (0-3 feet below ground surface)**

Please provide a reference for defining "surface soil" as 0 to 3 feet below the ground surface. Accidental ingestion of soil, outdoor inhalation of vapors and particulates from surficial soil emissions, and dermal contact with surficial soil do not typical occur with soils down to a depth of 3 feet below the ground surface.

**Appendix C, Section C.2.4.2 Representative Groundwater Concentration for Protection of Indoor Inhalation**

"Groundwater concentrations protective of indoor inhalation are typically estimated using a model such as the Johnson and Ettinger (2001) model. This model assumes no lateral or transverse spreading of the vapors as they migrate upward from the water table through the capillary fringe and the vadose zone and into the enclosed space. Thus, representative concentrations for this pathway should be based on groundwater concentrations measured within the footprint of the building or up to 20 feet from the building."

Please note that the Johnson and Ettinger model assumes a steady state groundwater concentration over the exposure duration (typically 30 years for a resident, 25 years for an industrial worker). This is conservative and does not take into account finite sources and natural attenuation.

**Table C-1, Calculation of Representative Concentrations, Surface Soil (0 to 3 feet)**

| Route of Exposure | Calculation of Representative Concentration |
|---|---|
| **Surficial Soil (0 to 3 feet bgs)** | |
| Soil concentration protective of leaching to groundwater or surface water body | Average of surface soil concentrations collected within the area of release. |
| Direct contact with soil including ingestion of soil, dermal contact with soil, and the outdoor inhalation of vapors and particulates emitted by surficial soils | Average of the surface soil concentrations within exposure domain for non-residential receptor. Maximum concentration for child receptor. |

This differs from USEPA Risk Assessment Guidance for Superfund (RAGS) which states that the upper confidence limit (UCL) of the surface soil data should be used for risk assessment of adult and children receptors.

## Appendix E.9 TARGET LEVELS FOR PROTECTION OF SURFACE WATER BODIES

**Step 1:**
"Determine stream classification: As per 10 CSR 20-7.031(1)(F), streams in Missouri are classified as Class C, Class P, or P1 waters. Stream classification applies to specific reaches of a stream and not necessarily to the entire stream length. Classification of streams and the length of the classified segment can be found in Table H of 10 CSR 20-7.031. Streams not included in Table H are unclassified (Class U) and have no assigned designated uses."

**Step 3: Determine stream water quality criteria:**
"For unclassified streams, applicable water quality criteria must be met at the point of groundwater discharge to the stream."

**Step 4: Determine 7Q10 and groundwater discharge:**
"Unclassified streams have a default 7Q10 value of 0.0 cfs."

**Step 7: Other considerations:**
"In addition to specific water quality criteria, general water quality criteria must be met in waters of the state at all times, including mixing zones. General water quality criteria are discussed in 10 CSR 20-7.031(3).
In addition to meeting chronic water quality criteria at the downstream edge of the mixing zone, acute water quality criteria must be met as per the following:
For Class C and unclassified streams, the acute criteria must be met at the point of discharge,
For Class P and P1 streams, the acute criteria must be met at the edge of the zone of initial dilution and throughout the mixing zone, and
For an unclassified stream that flows into a classified stream or becomes a classified stream downstream of the point of discharge, the acute criteria must be met at the point of groundwater discharge to the unclassified stream."

Comments:
Also, why does an unclassified stream follow the most restrictive criteria, and at the point of groundwater discharge to the unclassified stream? Many unclassified streams are urban drainages and tributaries to larger, classified streams, which allow mixing and dilution. Urban streams are also potentially impacted by other upstream and anthropogenic contaminant sources. Unclassified urban streams are prevalent throughout the state. If a stream is unclassified due to it not having surface water flow for part of the year and, having no assigned designated uses, it should not have complete exposure pathways and not be subject to the most stringent water quality criteria at the point of discharge to the stream.

Also - what is the process to get unclassified streams classified?

Step 7 discusses "chronic criteria" and "acute criteria." It is unclear what these values are. Are they ecological or human health-based criteria?

Why, if an unclassified stream flows into a classified one, are the acute criteria required to be met at the point of groundwater discharge to the unclassified stream. (This is stated in Step 7, 3rd bullet)? This situation is similar to groundwater entering a classified stream, where the procedure outlined in this text is used to determine the acceptable contaminant concentration in the upstream source, except the classified stream allows mixing/dilution.

**Table E-1, Toxicity Values of Chemicals**
**Table E-2, Physical and Chemical Properties of Chemicals**

Many chemical's toxicity values and physical and chemical properties are not included in the MRBCA guidance, including benzene, ethylbenzene, toluene, xylenes, methyl tertiary butyl ether (MTBE), benzo(a)pyrene and similar polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and arsenic. With the importance of those chemicals on final remedy selection and cleanup goals at many sites, it is important to have a review of all DTLs before they are promulgated as final.

**Table E-4, Fate and Transport Parameters**

Please provide a reference for the soil parameters selected for each soil type. Shouldn't dry bulk density and fraction organic carbon vary by soil type? There is little difference between silt and clay input parameters (only volumetric water content and volumetric air content). Shouldn't there be more of a difference in physical parameters between the soil types?

BP again wishes to express its appreciation for being involved in the stakeholder process and for being able to provide comments on this draft guidance document. If you have any questions, please do not hesitate to contact myself, Mr. Lloyd Dunlap, or Mr. Tom Tunnicliff at your convenience.

Respectfully submitted,

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***Comments from Scott Clardy***
***Department of Health and Senior Services***
***Received by Letter***

March 21, 2005

Linda Vogt
Department of Natural Resources
Hazardous Waste Program
PO Box 176
Jefferson City, MO 65102

Subject: **Technical Review and Comment on the Draft *Departmental Missouri Risk-based Corrective Action (MRBCA) Technical Guidance***

Dear Ms. Vogt:

Thank you for requesting the assistance of the Department of Health and Senior Services (DHSS) to review and comment on the *Departmental MRBCA Technical Guidance*. We congratulate the Department of Natural Resources (DNR) for reaching the goal of providing a framework for remediation decisions and at the same time protecting human health and the environment. DHSS wants to contribute to the process of making contaminated property safe for humans; therefore, we have assembled detailed technical comments to Sections 7, 8, 9, 10 and Appendix B and E of the guidance:

**General Comments**:

- As this guidance document will apply to multiple programs, which may have different terminology, there should be consistency with the terms used in the guidance. We recommend a comprehensive glossary be developed to accompany the guidance.

- DHSS' role in the framework of this process seems unclear upon reading Sections 7, 8, 9 and 10. The Cleanup Levels for Missouri (CALM) document clearly delineated DHSS' role in the CALM process. More discussion should be added to clarify where other agencies, such as DHSS, are included. For instance, typically a Tier 3 risk assessment work plan and risk assessment report would be reviewed by DHSS under CALM but MRBCA omits this prior role. The guidance document should be abundantly clear for remedial project managers, developers, and responsible parties. Also, new DNR personnel may not understand the role that the DHSS has in this process.

- We have had a chance to briefly look at the equations used in the MRBCA Guidance, but have never had a chance to see the software developed/provided by the RAM group. We believe that seeing this software would be beneficial to DHSS in understanding and comparing how the MRBCA process may differ from how we conduct risk assessments and develop clean-up levels. Under our present inter-agency work plan agreement, DNR is to provide software to facilitate risk assessment reviews that fall under that agreement.

## Specific Comments:

## Section 7.5

1) This section should reference the flowchart presented. Additionally, the flowchart and text should correspond to one another and contain more detail, providing a step-by-step procedure for eliminating chemicals.

2) We also recommend that a statement be included that documentation must be provided and any chemical that is eliminated be clearly identified and the reason for elimination clearly stated.

3) We recommend for clarification that the third bullet mention that a five percent frequency of detection out of 20 samples equals one detect.

4) We recommend the following for elimination of chemicals based on blank contamination:
    - For Common Laboratory Contaminants – eliminate if less than ten times blank (also, provide a listing of common lab contaminants for reference)
    - For Chemicals that are not common lab contaminants – eliminate if less than five times blank.

5) In bullet #4, please define the term "published sources."

## Section 7.6

6) Prior to the toxicity screen, a statement that the risk assessor should consider re-including specific contaminants on the basis of historical data, toxicity, mobility, persistence, bioaccumulation, and special exposure routes should be added.

7) According to the Environmental Protection Agency (EPA) 1989 reference cited in this section, the toxicity screen is used for a particular medium. Summing across media is not mentioned as a part of the procedure. Please address this discrepancy.

8) In Tables 7-1 and 7-2, the media described includes both soils and groundwater. However, secondary media such as sediment and surface water are not included. Also, units for chemicals should be included in the table.

**Section 8.0**

9) This section starts out by using the term "exposure pathway" but switches the term to "routes of exposure" and also "routes of exposure pathways." Please be consistent in the use of terms.

10) Section 8.4 should mention Appendix E.10, Lead Modeling, in the text.

11) In Section 8.4, the first sentence should say Appendix C, rather than Appendix B.

12) On page E.10 of the MRBCA Guidance Document, residential risked-based target levels (RBTLs) for lead are derived based on pharmacokinetic models (EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for children between six months and seven years of age and the EPA's Adult Lead Model). Run in the reverse, these models also allow the user to calculate lead RBTLs that are considered **acceptable**. The equations used in Step Six were not derived to calculate risk for lead. How will this difference be addressed under this step?

13) Pages 8-7 and 8-8 discuss the calculation of "exposure pathway-specific representative concentrations." This term should be changed to "exposure point concentrations."

14) The term "representative" should be defined to ensure that the "exposure pathway-specific representative concentration" or exposure point concentration accounts for both spatial and temporal data variance to suit the specific media contaminated and site-specific conditions.

15) Formula 8-1b sums up the hazard index for all of the associated pathways for a given chemical. This procedure may not be appropriate for a particular chemical because different pathways may produce a different endpoint. For example, chemical X has a reference dose based on chronic oral exposure *(*RfDo) studies that mention the liver and kidneys as end points, while its inhalation reference dose concentration (RfC) is developmental. This may or may not be additive.

**Section 9.0**

16) In Section 9.1, the term "sensitivity analysis" is used. For clarity, this term should be defined, including reference to any source document outlining the procedure required to perform such analysis.

17) In Section 9.1.1, *Depth to Subsurface Soil Sources ($d_{ts}$),* the sentence reads, "A reasonable value would be a concentration weighted average depth." Removing this sentence would help clearly define the project manager's choices. The sentence prior to this comment seems to adequately define the acceptable choices.

18) In Section 9.1.1, *Thickness of Capillary Fringe ($h_c$),* it is assumed that the thickness of the capillary fringe (zone) will be added to the total depth from grade in order to determine the depth to contaminated groundwater. According to the EPA Johnson/ Ettinger (JE) vapor intrusion model, the thickness of the capillary zone is known to be as thick as one hundred ninety-two centimeters (192 cm) for silty clay soils. Because this zone is initially not considered contaminated, which directly retracts from the parameter for the thickness of the vadose zone ($h_v$) as well as depth to the source ($d_{ts}$), more discussion should be given for estimating this parameter when the potential for non-aqueous phased or free-phase liquids may be present.

19) In Section 9.1.1, *Groundwater Mixing Zone Thickness*, the symbol used to denote this parameter could not be found in any of the formulas.

20) In Section 9.3, bullet four, the term "toxicologist" is used. A definition of toxicologist including any professional requirements should be included in the guidance.

21) In Section 9.4, *Analytical Detection Limits*, Item 3 uses the term "maximum detection limit." This term is not consistent with common detection and quantitation limit terminology and is confusing. We recommend using terminology consistent with Environmental Protection Agency's *Guidance for Data Useability in Risk Assessment (Part A)*, Publication 9285.7-09A, PB92-963356, April 1992.

22) In Section 9.5, Step 4: *Recommend the Next Course of Action*, the *Action vs. Calculated Risk*, the table uses column headings "Individual" and "Cumulative." This is not descriptive of the category. Additional wording such as "Individual Chemical of Concern" and "Cumulative, Site-Wide Risk" would be more descriptive.

**Section 10**

23) Section 10.0 did not include steps to evaluate the indoor air pathway. We found this pathway in the Appendix C. 2.2.2 of the MRCBA document, but Section 10.0 does not mention it.

24) Section 10.1 uses the term, "technically defensible" to describe the use of alternative fate and transport models. How are fate and transport models to be technically defensible? If they are peer reviewed, are they not defended in that fashion? What criteria will DNR use to evaluate these models?

25) Section 10.1 mentions the use of subchronic toxicity values for non-carcinogenic effects when exposure is less than seven years The text should mention that subchronic toxicity values are not as widely available as chronic values, and unlike chronic reference dose values (RfDs) and reference dose concentration values (RfCs), no EPA work group exists to review and verify subchronic RfDs or RfCs. Subchronic toxicity values for a limited number of compounds are available from EPA's Health Effects Assessment Summary Tables (HEAST). The Agency for Toxic Substances and Disease Registry (ATSDR) publishes Minimal Risk Levels (MRLs) that may be suitable for use as subchronic toxicity values.

26) EPA's Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (December 2002) provides separate volatilization factor (VF) and particulate emission factor (PEF) equations for construction scenarios with subchronic exposure, where 1996 Soil Screening Guidance are intended for residential and commercial/industrial scenarios with chronic exposure. This distinction should be made clear in this section of the guidance.

27) Section 10.0 did not include a discussion about the non-standard method of calculating risk for lead.

28) Section 10.4 mentions the use a toxicologist to perform analysis of segregating the chemicals of concern by target organ. Categorizing chemicals into groups requires a search through literature sources that are readily available to many people via the Internet. This information is well organized, and if someone who has some

knowledge of toxicology were to review toxicology information, he/she would be capable of categorizing the chemicals by their health effects. Please describe how these specialists are more preferable.

**Appendix B**

29) Table B-1, B-2, B-3, and B-4. To eliminate confusion, the use of the lowest default target levels and the default target levels (soil-type specific) should be described in the text, preferably in Section 7.0. It appears that Section 2.0 provides an overview of these risk assessment options. Providing a more complete description of each tier and detailing each step in the process by relating it back to Figure 2-2 MRBCA Process Flowchart, would clarify this and aid the reader in understanding the process.

**Appendix C**

This section is poorly cited in Sections 7, 8, 9 and 10. We think logical reference to portions of Appendix C, as needed, should be included in these important sections.

**Appendix E**

**Table E1, Toxicity Value of Chemicals**

30) Because the EPA is the deciding authority for carcinogenic effects, the column **Cancer Group** title should include the acronym **EPA**.

31) For the purpose of calculating risk additivity, a table should be provided that includes the endpoints (target organs) associated with the toxicity values.

32) For 2-methyl-4,6-dinitrophenol, an EPA provisional peer-reviewed toxicity value (PPRTV) for the oral reference dose (RfDo) of 1.0E-04 mg/kg day should be considered versus the MRBCA value of 2.0E-03 mg/kg day. MRBCA's value is derived from a tertiary source; Texas Risk Reduction Program (TRRP) Tier 1 protective concentration level (PCL) table.

33) For 1,2-dibromo-3-chloropropane, a reference dose for inhalation (RfDi) value of 5.7E-06 mg/kg day from EPA's Integrated Risk Information System (IRIS) is available. MRBCA lists the value at 6.9E-05 mg/kg day, also noted as an IRIS value.

34) For 2-Nitrotoluene, the EPA's Health Effects Assessment Summary Table (HEAST) provides a similar value for the RfDo. HEAST would be a better reference than the TRRP guidance.

35) It appears that the RfDi for 3-nitrotoluene extrapolated from an RfDo is not from PPRTV, but from HEAST. Please review and revise the MRBCA document accordingly.

36) For 1,1-dichloroethane, National Center for Environmental Assessment (NCEA) papers utilize an RfDi of 1.4E-02 mg/kg day. MRBCA lists a HEAST value of 1.4E-01. The listing found in the July 1997 version of HEAST, page 1-37 lists a chronic

RfD for inhalation as 1.0E-01 mg/kg day. Please justify the use of value provided in MRBCA.

37) For 1,2-dichlorobenzene, MRBCA lists the RfDi as 5.7E-02 mg/kg day from HEAST. This value could not be found in the 1997 HEAST table. Please review to determine if this is the correct reference.

38) According to Risk Assessment Issue Paper for Derivation of Provisional Chronic RfDs for n-Butyl benzene (Chemical Abstract Service Registration Number (CASRN) 104-51-8), sec-Butyl benzene (CASRN 135-98-8), tert-Butylbenzene (CASRN 98-06-6), and n-Propylbenzene (CASRN 103-65-1), the provisional oral RfD for n-butyl benzene, n-propylbenzene, sec-butyl benzene and tert-butylbenzene would be 1E-2 mg/kg day.

39) For the polychlorinated biphenyls (CASRN 1336-36-3), IRIS suggests the use of 1.0E-01 $mg/m^3$ as a unit air risk. Converted, the slope factor for inhalation (SFi) is 3.5E-01 $(mg/kg\ day)^{-1}$. MRBCA suggests the use of 2.0 $(mg/kg\ day)^{-1}$ for Aroclor 1221, Aroclor 1242, Aroclor 1248, Aroclor 1254, and Aroclor 1260. IRIS provides an SFi of 3.5E-01 for Aroclor 1260 and for all of the Aroclors listed, an SFi of 4.0E-01 is provided. A review of the current toxicity data within IRIS is recommended to support MRBCA's toxicity values.

40) DHSS could not locate the following HEAST toxicity value: Allyl chloride (107-05-1), RfDo of 5.0E-02 mg/kg day. Please review HEAST and NCEA for more information to support this value.

41) DHSS could not verify the following California Environmental Protection Agency (CalEPA) toxicity value: Bromodichloromethane SFi and the oral slope factor (Sfo) for 1,4-dichlorobenzene. Please review CalEPA toxicity records for more information to support this value.

42) DHSS could not verify the following NCEA values: 1,2-dichlorobenzene RfDo of 9.0E-04 mg/kg day, 1,3-dichlorobenzene RfDo, and 1,4 dichlorobenzene RfDo. Please review NCEA records for more information to support these values.

43) The SFo for 1,4-dichlorobenzene in HEAST is 2.4E-02 $(mg/kg\ day)^{-1}$. Please review and revise the MRBCA document accordingly.

44) The SFi for 1,2-dichloropropane in CalEPA is 3.6E-02 $(mg/kg\ day)^{-1}$. Please review and revise the MRBCA document accordingly.

45) For tetrachloroethylene, CalEPA lists an SFo as 5.4E-01 and a SFi as 2.1E-02 $(mg/kg\ day)^{-1}$. Please review and revise the MRBCA document accordingly.

46) For bis(2-ethylhexyl)phthalate, a SFi of 1.1E-06 $(mg/kg\ day)^{-1}$ from NCEA Risk Assessment Issue Papers from 9/20/95 is available. Please review and revise the MRBCA document accordingly.

47) For 2,4-dinitrotoluene, the cancer group needs to be B2 according to CalEPA's reference notes.

48) For carbazole, the cancer group is a B2 according to HEAST. Please review and revise the MRBCA document accordingly.

49) For 3-nitroaniline, according to PPRTV, the RfDi should be 3.0E-04 mg/kg day, not 2.9E-04 mg/kg day. Please review and revise the MRBCA document accordingly.

50) For alpha-hexachlorocyclohexane, the extrapolation from RfDo to RfDi is one order of magnitude greater according to DHSS calculations. Please review and revise the MRBCA document.

51) For chlorothalonil, the SFo used by MRBCA is less conservative than HEAST's value of 1.1E-02 $(mg/kg\ day)^{-1}$. Please review and revise the MRBCA document accordingly.

**Table E.2**

52) Table E.2 uses the EPA Region IX, Preliminary Remediation Goals InterCalc Tables: Physical-Chemical Data dated October 1, 2002. There was an update of these tables in October 2004. Please check these tables to be sure the most recent information is being used.

53) Equations used in Appendix E for dermal contact to surface soil and groundwater reference the Environmental Protection Agency's *Risk Assessment for Superfund (RAGS), Volume I, Part A, 1989. Risk Assessment Guidance for Superfund: Volume 1 – Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment* should be used, as it is the most current guidance for dermal absorption. RAGS, Part E utilizes the dermally absorbed dose per event ($DA_{event}$) factor, which provides an estimate of total dose dissolved in the two main layers of the skin at the end of the exposure. We recommend that DNR use RAGS, Volume I, Part E, 2001, Appendix D, page D-2 for organic chemicals in water.

**Table E.3, Exposure Factors**

54) The following revisions to Table E.3 were discussed within workgroup sessions with DNR. These recommended values are more representative of a reasonable maximum exposure (RME) scenario for the associated receptors. The RME scenario is important because RME estimates a conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures. Instead of combining many sources of uncertainty into average and upper-bound exposure estimates, the variation in individual exposure variables is used to evaluate uncertainty. We would like DNR to re-consider the following exposure factors that we have researched and think are more representative of each receptor:

1. Soil Ingestion Rate for the Construction Worker -- change from 100 mg/day to 330 mg/day (Source: Exhibit 1-2 (page 1-5) of the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (OSWER 9355.4-24, December 2002)). This accounts for the intensive soil contact that may be assumed in a construction worker scenario.

2. In previous discussions with DNR, we had recommended inhalation exposure rates that were higher than those represented in Table E.3. We are not recommending indoor or outdoor inhalations rates at this time because values in Table E.3 are satisfactory for current central tendency exposures. When developing a risk assessment under Tier 3 with a future scenario, we think the guidance should provide provisions for inhalation rate values that are more representative of reasonable maximum exposure (RME). The existing exposure values in Table E.3 will not fit every scenario.
3. Skin Surface Area Exposed to Soil for the following;
    a. Resident Child – change from 4,263 $cm^2$/day to 2,800 $cm^2$/day,
    b. Resident Adult -- change from 4,714 $cm^2$/day to 5,700 $cm^2$/day, and
    c. Non-Residential Worker and Construction Worker -- change from 4,714 $cm^2$/day to 3,300 $cm^2$/day (see the table (Exhibit 3-5) below from Page 3-20 of EPA RAGS, Part E);
4. Soil to Skin Adherence Factor for the following;
    a. Resident Child -- change from 1 mg/$cm^2$ to 0.2 mg/$cm^2$,
    b. Resident Adult -- change from 1 mg/$cm^2$ to 0.07 mg/$cm^2$,
    d. Non-Residential Worker -- change from 1mg/$cm^2$ to 0.2 mg/$cm^2$ (see the table (Exhibit 3-5) below from Page 3-20 of EPA RAGS, Part E); and
    c. Construction Worker -- change from 1 mg/$cm^2$ to 0.3 mg/$cm^2$ (see the table (Exhibit 3-3) from Page 3-18 of EPA RAGS, Part E)

**EXHIBIT 3-5**

**RECOMMENDED DERMAL EXPOSURE VALUES FOR CENTRAL TENDENCY AND RME RESIDENTIAL AND INDUSTRIAL SCENARIOS – SOIL CONTACT**

| Exposure Parameters | | Central Tendency | | RME Scenario | |
|---|---|---|---|---|---|
| | | Residential | Industrial | Residential | Industrial |
| Concentration- $C_{soil}$ (mg/kg) | | site-specific values | | | |
| Event frequency (events/day) | | 1 | 1 | 1 | 1 |
| Exposure frequency (days/yr) | | site-specific | 219 | 350 | 250 |
| Exposure duration (yr) | | 9 | 9 | 30 | 25 |
| Skin surface area ($cm^2$) | Adult | 5,700 | 3,300 | 5,700 | 3,300 |
| | Child | 2,800 | NA | 2,800 | NA |
| Soil adherence factor (mg/$cm^2$) | Adult | 0.01 | 0.02 | 0.07 | 0.2 |
| | Child | 0.04 | NA | 0.2 | NA |
| Dermal absorption fraction | | chemical-specific values (Exhibit 3-4) | | | |

NA: not applicable

5. We recommend the addition of a new category titled Skin Surface Area Exposed to Water to include the following receptors and exposure factors: a) Residential Adult –18,000 $cm^2$, and b) Residential Child -- 6,600 $cm^2$. These values should be considered for residential showering/bathing scenarios (See Exhibit 3-2 page 3-8 of EPA RAGS, Part E (EPA OSWER 9285.7-02EP, July 2004).

We look forward to your responses to these comments. If you have any questions, please feel free to contact Todd Blanc, Andrew McKinney, or Daniel Creek at (573) 751-6160.

Sincerely,

Scott A. Clardy, Administrator
(original signed by Scott Clardy)
Section for Environmental Public Health

SAC:TJB:tlk

***Comments from Tim Hippensteel***
***TH Environmental, LLC***
***Received by email and email attachment 3-25-05***

Ms. Vogt,
Please see attached.

Tim Hippensteel
TH Environmental, LLC
340 W. Argonne Dr.
St. Louis, MO 63122
314.835.9811
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tim@thenviron.com

Draft "Departmental Missouri Risk-Based Corrective Action (MRBCA) Technical Guidance:" Review and Comment

I have the following specific comments in response to Bob Geller's February 18, 2005 Memo:

1) Land Use – I agree that the phrase "reasonable" is too vague. A change in wording to "current or future use" or "current or anticipated future use" would be acceptable. It has been my experience with numerous Brownfield and Brownfield-type redevelopment projects in urban areas that plans are typically proposed for future site uses prior to engaging in the BVCP process. The plans can, and do, change for a variety of reasons but typically are still redeveloped for commercial/light industrial and commercial/retail/residential (anticipated) future uses. The phrase change should not be disguised to be too restrictive or limiting to anticipated future uses, either.

2) Chemicals of Concern – I agree with this change. Cost effectiveness in the BVCP process is of utmost concern on all redevelopment projects and to all parties involved. The elimination of as many COCs as possible early on in the BVCP process will produce a timelier project as well as cost efficiencies regardless whether DED remediation tax credits are involved. The proposed flowchart (Figure 7.1) does an adequate job of portraying the COC elimination process.

3) Ecological Risk Assessment, Checklist B – It is my opinion that a reasonably competent person engaged in the profession of environmental science, environmental geology, or environmental engineering could complete this, and the other, checklist.

An additional general comment on Ecological Risk Assessments. It is my experience, with involvement in numerous BVCP Brownfield and Brownfield-type redevelopment projects in urban areas, that the Ecological Risk Assessment is a waste of time, for the most part. Due to the very nature of the urban setting, there are usually no ecologically sensitive receptors to be impacted, either potentially or in actuality. Elimination, or at least a drastic reduction, in this requirement may need to be considered on a site by site basis for redevelopment projects entered into the BVCP.

***Comments from Norella Huggins***
***Hazardous Waste Management Commission***
***Received by e-mail: 3-28-05***

Dear Linda,

Below are some comments on the Draft Departmental MRBCA Guidance:

l. Ecological Risk Assessment, Checklist B. This change appears to be acceptable because, in the presumably rare event that Checklist B must be completed, the consultant is likely to have an engineer or other professional on staff to make the question 7 determination at, hopefully, little extra cost.

2. Land Use. I believe that the terms and provisions of the two guidances (petroleum storage tanks and all others) should generally be consistent. The tanks guidance uses the term "most likely future use" and gives objective criteria for the determination at page 6-2. The tanks guidance also uses the term "reasonably anticipated future use" at page 11-1 of its AUL policy. It would seem better to change the term "future use" to be consistent with the tanks guidance. I think the CERCLA cleanup guidance may also use the term "reasonably anticipated future use."

3. Section 11.5 Information and Tracking. Commenters are asked to offer opinions on the appropriate repository for site information. Since the Hazardous Waste Program intends to maintain all site information anyway, it would seem redundant and not worth the resources required to also have the Secretary of State's office or other office maintain the information as well.

4. Section 11. Some real estate and environmental attorneys commented last fall on the previous draft of Section 11 and some changes may have been made in response. In summary, their comments were:
The wording gives a negative impression and would benefit by being made friendlier to encourage use of the Voluntary Cleanup Program.

To help make property transferable and marketable, the guidance should help you deal with uncertainly, but this is ambiguous and not concrete enough.

Make the coventants shorter, with no recitals. It needs objectivity, not the current subjectivity in the wording.

There needs to be a safe harbor or liability limiting.

You don't want a clause that if you ever want to build, you have to ask permission. You want to just give notice and certify.

Make the liability non-recourse. Make the remedy come out of the land only.

Assume people will do what is right, rather than the opposite. The current covenant for the VCP reads like a consent decree. It feels like enforcement but it is supposed to be voluntary.

***Comments from Ruth C. Mannebach***
***NPN Environmental***
***Received by email: 3-23-05***

The CALM Guidance Document included Cleanup Levels for Surfaces and Building Interiors (CALM, Appendix B, Section 7), which addressed asbestos abatement, lead abatement, and PCB-contaminated structures. It is my understanding the MRBCA guidance will replace CALM. Will cleanup levels for surface and building interiors be addressed in the final MRBCA document? Thank you.

Ruth C. Mannebach
Senior Environmental Scientist
NPN Environmental
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***Comments from Earl Pabst, Director***
***Environmental Services Program, MDNR***
***Received by Memorandum***

**MEMORANDUM**

DATE: March 28, 2005

TO: Linda Vogt
Hazardous Waste Program, ALPD

FROM: Earl Pabst, Director
Environmental Services Program, ALPD

SUBJECT: MRBCA Guidance

We have reviewed the draft Missouri Risk-Based Corrective Action (MRBCA) guidance document. We have the following comments for consideration:

**General Comments:**

1. When dealing with sediments/soils, the only way to allow analytical results to be comparable with one another or to established criteria is to normalize them to a benchmark. The established benchmark that is universally used is “dry weight basis”. The ESP laboratory reports sediment/soil samples on a dry weight basis. We would recommend adding this requirement where applicable throughout the guidance document.

2. Several terms are used in the document that are not defined in Appendix L. We would recommend that you consider defining these terms.

**Specific Comments:**

1. The Environmental Services Program (ESP) is listed in the second paragraph of Section 1.1 as one of several programs that "are often involved in risk management decisions", which is accurate. However, in Section 3.0 Remediation Authorities in Missouri, where the specific departmental program roles are discussed, the ESP is not included. We would recommend that the department’s authority in enforcing Section 260.500 - 260.550, RSMo and 10 CSR 24-1.010 through 3.010 should be discussed in Section 3.0. There are some sites where the ESP continues to have responsibility to ensure the site is remediated. This can and has involved a risk-based cleanup. We would be happy to provide some language to include.

2. Section 2.2.2 is problematic and may cause confusion. First, this section implies that a responsible party must report a hazardous substance release if it meets any of the six bullet statements. A responsible party is required to report a hazardous substance release in accordance with Section 260.500 (5), RSMo not the bullet points in Section 2.2.2.

The examples of abatement measures listed in this section appear to be all inclusive and definitive. In the event of a significant environmental emergency, the department issues a hazardous substance emergency response declaration. This legal document defines the immediate steps including any reports to be taken by the responsible party to end the environmental emergency.

We have attached a draft, revised narrative for this section which clarifies the requirements in Section 260.500-550, RSMo.

Finally, you might want to consider incorporating Section 2.2.2 into the Section 4.0 on the Management of Imminent Threats. This would appear to be a better fit.

3. Section 2.2.3 states that upon completion of any environmental response action, an initial characterization must be completed. This assumes that every environmental response action is an imminent threat and the responsible party intends to conduct a risk-based cleanup. That is rarely the case. In the majority of the hazardous substance releases, the responsible party cleans up the site and the incident is closed. For example, in a 200-gallon diesel spill from a tractor-trailer accident contained on the highway right-of-way, the responsible party would remove any remaining free product and excavate the contaminated soil. No further action is normally required. In the case of a leaking 55-gallon drum of solvent at a paint factory, the solvent is cleaned up and properly disposed of. There is no risk-based cleanup necessary and the guidance and rule would not apply.

   This is not clear in Section 2.2.3.

4. In Section 4.2, both a "hazardous substance" and a "hazardous substance emergency" are defined where the reporting requirements and imminent threats are discussed. However, both definitions are inaccurate and incomplete. For clarity, it is suggested that the definitions be copied straight from Section 260.500, RSMo.

5. Also, Section 4.2 states that "upon completion and documentation of the emergency response activities, and if the release of a hazardous substance is confirmed, additional data may be needed to perform a risk-based evaluation and to receive a Letter of Completion". Again, the applicability of MRBCA to EER-directed cleanups is not clear. In the majority of incidents where the responsible party may

consider a risk-based cleanup, the ESP would have already ended the environmental emergency and transferred the site to the appropriate regulatory program (e.g., HWP Tanks Section) for any long-term remediation required. It should also be pointed out that the ESP does not issue "Letters of Completion" or "No Further Action" letters.

6. Finally, Section 4.4 states that the "remediating party" must submit a "Hazard Abatement Report" after completion of the emergency response actions. This may be a requirement of the RBCA rule and guidance, but it is not a requirement in Section 260.500-550, RSMo. This needs to be clarified. You may also want to define this term in Appendix L.

We appreciate the opportunity to review and comment on the guidance. If you would like to discuss any of our comments, please let me know.

Thanks.

EP:sb

Attachment

REGFORM
REGULATORY ENVIRONMENTAL GROUP FOR MISSOURI

***Comments from Kevin Perry***
***Regform***
***Received by email***

**March 24, 2005**

Ms. Linda Vogt
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

**Subject: Draft MRBCA Technical Guidance**

Dear Ms. Vogt:

Thank you for this opportunity to comment on the above-referenced document.

These comments are jointly offered on behalf of both REGFORM and St. Louis RCGA. We are responding primarily to the issues raised in Robert Geller's February 18, 2005 memorandum.

1. Registered Geologists. Regarding the issues related to the Geologist Registration Act, we request that the Draft Guidance be changed to eliminate *requirements* for a R.G. or P.E. to do field work. For example, on p. 6-26, section 6.12.1, the draft states that a registered geologist "must log." We believe this is in conflict with the law that states that the work does not need to be performed by the R.G.; rather, the work can be done "under the supervision of" a R.G. or P.E.

2. Eco-Risk Karst Determinations. We believe that the guidance should explicitly acknowledge that the function of determining proximity to karst features/topography that is accomplished by questions 7b and 7 of Checklist B does not always require a field determination. GSRAD staff at stakeholders meetings said advised us that consulting their maps was adequate for this determination. Specifically, the GSRAD MEGA database "caves layer" is ideal for making this determination.

3. Soil Type Determinations. On a related topic, we also request that the draft guidance be revised to make explicit that soil type determinations can also be made by visual classification of soil cores to confirm the accuracy of the geologic information in the MEGA database (i.e., "surface geology" data layer). [Note: This information is not in the current draft of the Guidance document; rather, it is in the 3/18/2005 Tanks guidance memo we assume will be incorporated in some fashion into this Guidance.]

4. Land Use. We request that the draft guidance document be changed so that "future use" is returned to the language used by the stakeholder group: "reasonably anticipated future

use." "Reasonably anticipated future use" has particular meaning in USEPA guidance and it was meaningful to stakeholders. That meaning should be preserved.

If the Department is trying to create or enhance enforcement authorities, we believe existing enforcement authorities are well documented elsewhere and need not be expanded here.

5. Ecological Risk Assessment at Default Target Level. Of the 16 tables in Appendix B, most, if not all, were missing page 9 of 9. We believe the missing COCs have been addressed in a recent (3/21/2005) email from J. Balkenbush. We would appreciate having more time to review these tables since they've only been available to us a few days.

6. Long-Term Stewardship. We believe that stakeholder meetings were discontinued before this and related issues were adequately discussed for the development of a consensus position. We do not believe that these issues can be sufficiently resolved using this process of commenting on the draft guidance document. Therefore, we request that the stakeholder group be reconvened for the purpose of reaching consensus on LTS/AUL issues.

   We observe, for example, that Section 11 of the Draft guidance is predicated on the development and use of a tracking system. We believe that the institution of such a tracking system fails to take into consideration some of the realities of the real estate market, and may produce a result opposite to the one that we intended. We suggest that these references to a tracking system and/or similar registries be stricken from this document.

   We also believe that annual reporting requirements should be stricken. We believe that restrictive covenants, recorded against the land, have proven to be well-understood and workable. There exists already a degree of comfort in Missouri for this type of LTS. We would like to see Section 11 revised to reflect this approach to LTS.

   We believe references to UECA, as on pp. 11-1 and 11-2, should be stricken from this draft document.

7. Dispute Resolution Process: We believe that further discussion by the stakeholders group on this topic would be beneficial. In order to avoid as much dispute as possible, only actually affected parties should be provided the opportunity to comment on or request a review of a site-specific management plan. Therefore, the term "affected party" should be clearly defined in the guidance and associated regulation. If merely interested parties are allowed these opportunities, the process at any site could come to a halt by requested reviews and disputes filed solely to impede progress.

   We believe that conference, conciliation and persuasion (CC&P) should be the first step in dispute resolution. Should a hearing ultimately be required, we believe those hearings and the decisions rendered should be rendered in an open forum.

8. Chemicals of Concern: We like this section of the Draft Guidance. We appreciate the focus on identifying those chemicals of concern that will really drive risk and risk estimation. We offer no editions at this time.

9. Data Quality Management. We are concerned that this section, as written, may hamper corrective action in Missouri. We believe that many non-RCRA and non-CERCLA sites

in Missouri have been cleaned up without requiring QAPPs, as in Appendix K. If the intent is to require QAPPS like those required for RCRA & CERCLA for tanks or VCP sites, this could deter us from the goal which we seek: more right-sized clean-ups appropriate to the level of associated risk. We believe that "Federal-style" QAPPs are not now required for non-RCRA and non-CERCLA sites in Missouri. Possibly, further clarification of the requirement is all that is required here.

In addition, we believe that more time for review of this document is needed. We share the desire to have RBCA established and implemented in a predictable, transparent and timely way in Missouri. However, we are concerned about the introduction of the "Water Quality Standard" language to this Draft document. We do not know, at this time, the full extent of the impacts of what could be a significant change in this guidance. We request that the stakeholder group meet to address this issue, as well as the AUL issue mentioned above.

Also, we were very satisfied in our discussion with MDNR on the tanks RBCA guidance that the Department made a commitment to revisit issues pertinent to RBCA as the state of the science changed and inconsistencies or deficiencies in the technical guidance were revealed through implementation. For example, we believe that modeling and understanding the vapor intrusion pathway is in flux. We anticipate significant changes in policy and technical understanding to emerge shortly. MDNR has committed to revisiting that issue with us for tanks guidance when important conclusions or findings emerge. We request that a similar commitment to revisiting issues be made for this Guidance as well.

Finally, we believe that GSRAD's MEGA database can and will play a key role in keeping the RBCA process efficient. We want to comment here that we think funding and on-going maintenance of the MEGA database is important. We want to join the Hazardous Waste Program in voicing our support to key decision-makers on this issue. We welcome any opportunities you might identify for us to "chime in" on the value of this important resource.

Thank you for you efforts in developing this important draft guidance. And thank you for giving us this opportunity to comment. We look forward to working with MDNR staff, managers, and other stakeholders to bring to fruition a final guidance that will serve to make more efficient and cost-effective corrective actions in Missouri a reality.

Sincerely,

Kevin L. Perry
**President**

***Comments from Jeffery Robichaud***
***USEPA***
***Received by Fax***

MEMORANDUM

SUBJECT: Preliminary Evaluation of MRBCA Guidance

FROM: Jeffery Robichaud
ENSV/DISO

TO: Jody Hudson
ARTD/RCAP

Thank you for the opportunity to provide comment on the Missouri Risk-Based Corrective Action Technical Guidance. Region 7's Data Integration and Support Operations Branch (DISO) is currently in the process of reviewing both the Technical Guidance and associated Appendices for consistency and equivalency with EPA's policies, administrative requirements, and guidance as they relate to Risk Assessment. Given our existing commitments, we anticipate that our full review will be completed by April 30th.

Although our review is ongoing, a preliminary evaluation of the documents indicated several areas on which we are likely to provide comment including (but not limited to):

- The discussion of future groundwater use;
- The voracity and submittal of data collection work plans;
- Further discussion and/or clarification of text regarding calculation of site-wide risk;
- Basis for development of default target levels for contaminants where there appear to be discrepancies between EPA default levels and MRBCA levels;
- Instances where default target levels have been developed by EPA, but for which are not found in the MRBCA document; and
- Dated nature of various toxicity values.

For the above list it should be noted that our final comments will concentrate on the Risk Assessment implications associated with the documents, although each of the aforementioned areas will also have policy and programmatic dimensions that must be given weight. Since RCAP staff serve in a formal capacity as part of the MRBCA workgroup, please feel free to incorporate our thoughts in your submittal as you see.